



The contributions of short-lived climate pollutants to global climate change since the pre-industrial era

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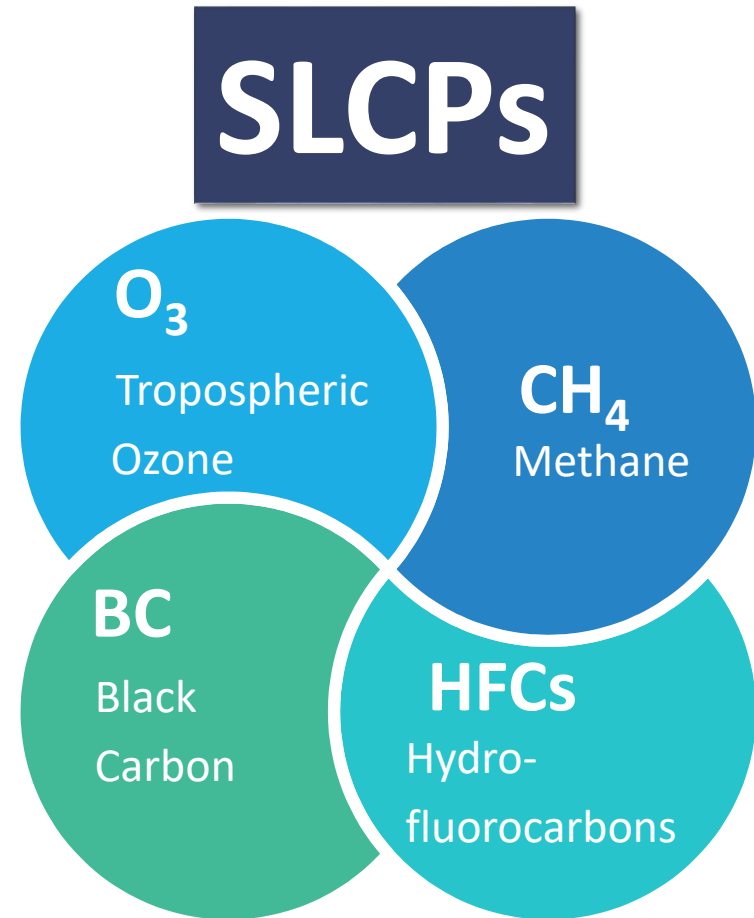
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Introduction

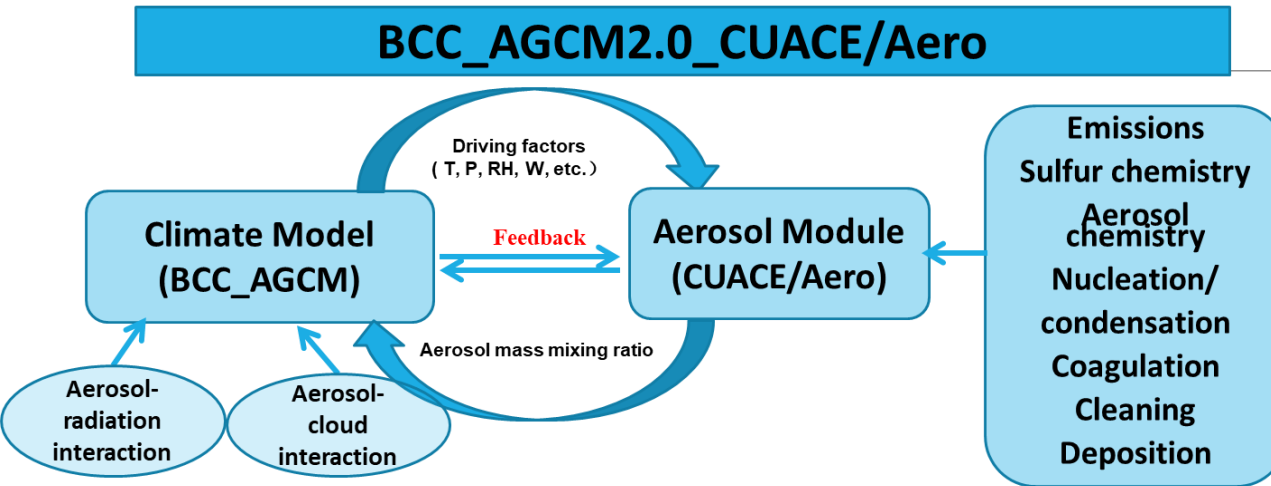
Short-Lived Climate Pollutants (SLCPs)

SLCP is a set of warming climate forcers, which are gases and particles that can affect the climate by modifying the global energy budget and influence human health, and have a relatively short lifespan in the atmosphere compared to carbon dioxide and other longer-lived gases.





Model and Experimental design



The framework of the aerosol-climate coupled model used in this work

Six sets of experiments to calculate

ERFs :

$ERF_{1850} / S_{ERF2010} / C_{ERF2010}$

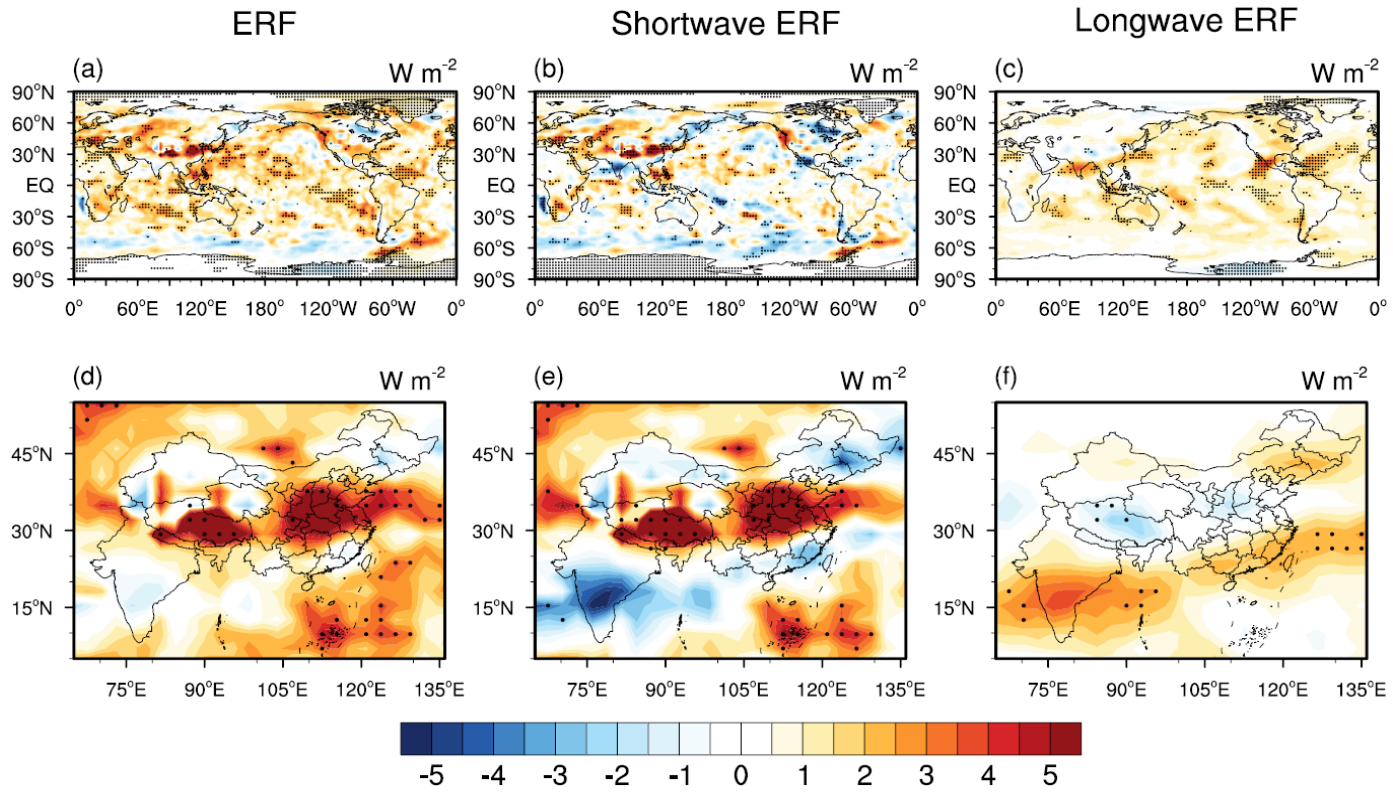
Climate Response:

$CR_{1850} / S_{CR2010} / C_{CR2010}$

Test Name	CO ₂ concentration	SLCF concentration	Sea temperature	Running time
ERF ₁₈₅₀	1850	1850	Prescribed SST ^①	15 years
S _{ERF2010}	1850	2010	Prescribed SST	15 years
C _{ERF2010}	2010	1850	Prescribed SST	15 years
CR ₁₈₅₀	1850	1850	Slab ocean model ^②	70 years
S _{CR2010}	1850	2010	Slab ocean model	70 years
C _{CR2010}	2010	1850	Slab ocean model	70 years

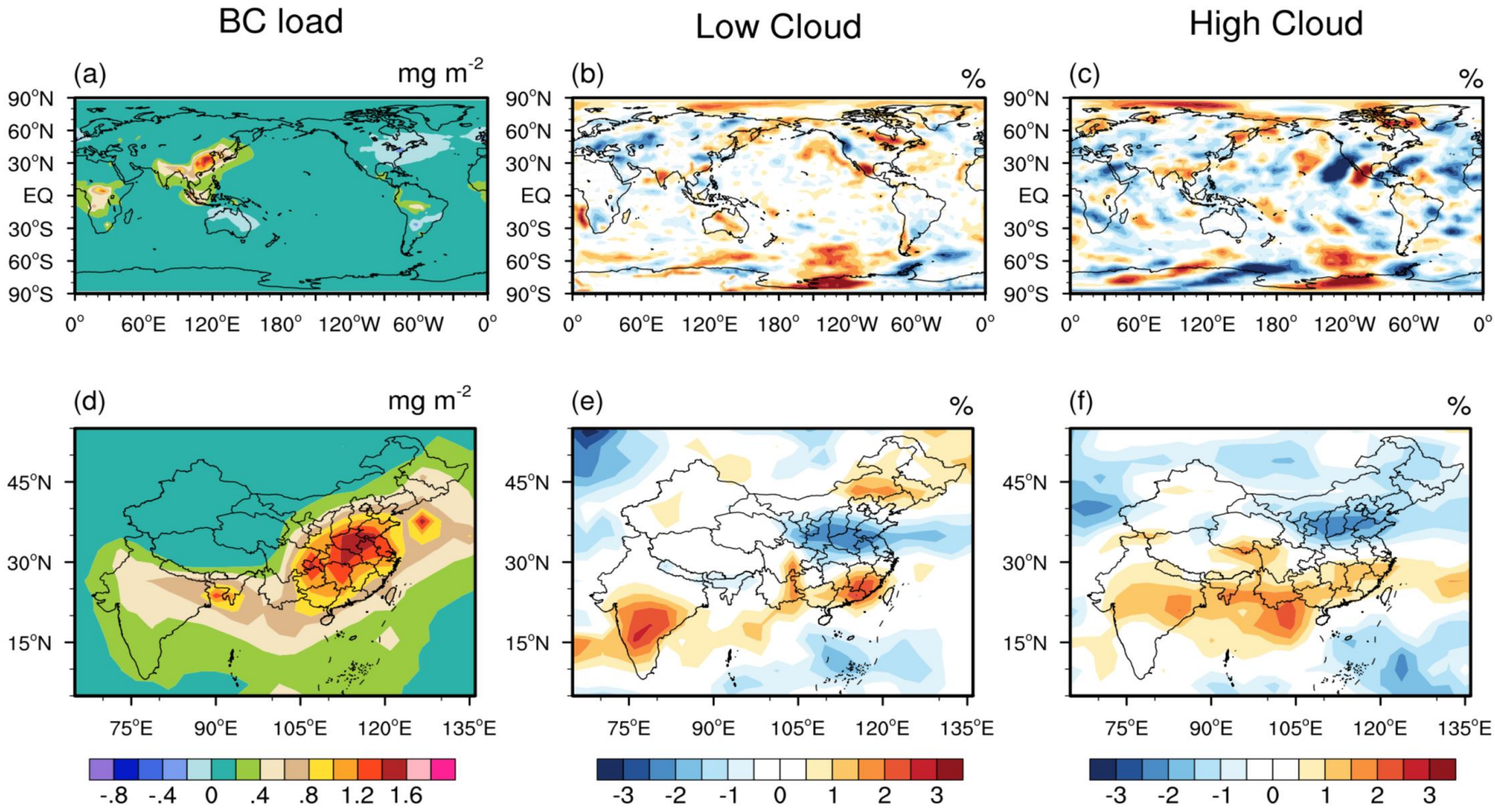


Effective Radiative Forcing



Annual mean ERF (left column), shortwave ERF (middle column), and longwave ERF (right column), which are obtained by the difference between $S_{ERF2010}$ and ERF_{1850}

Results

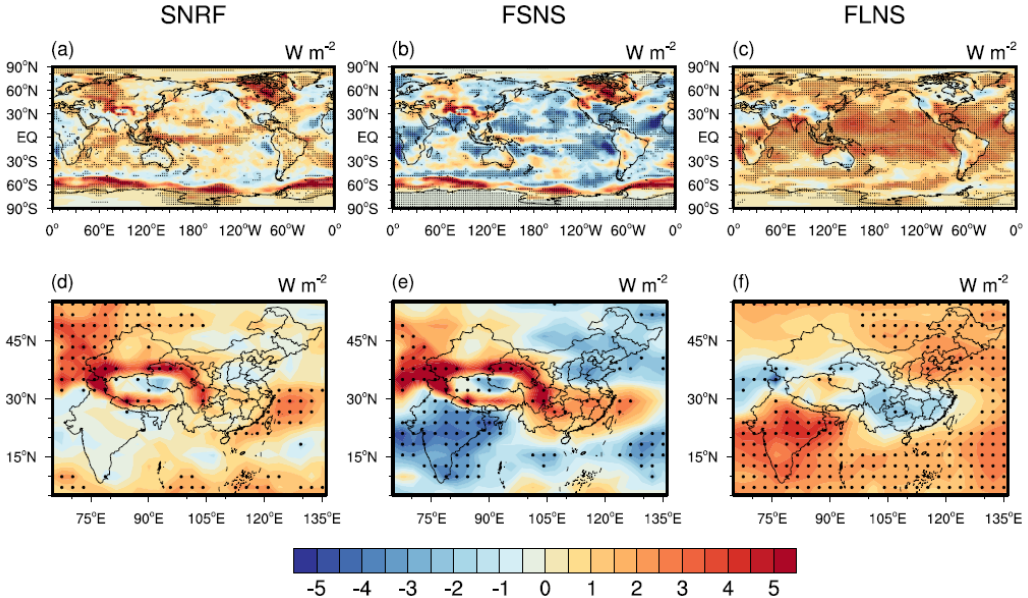
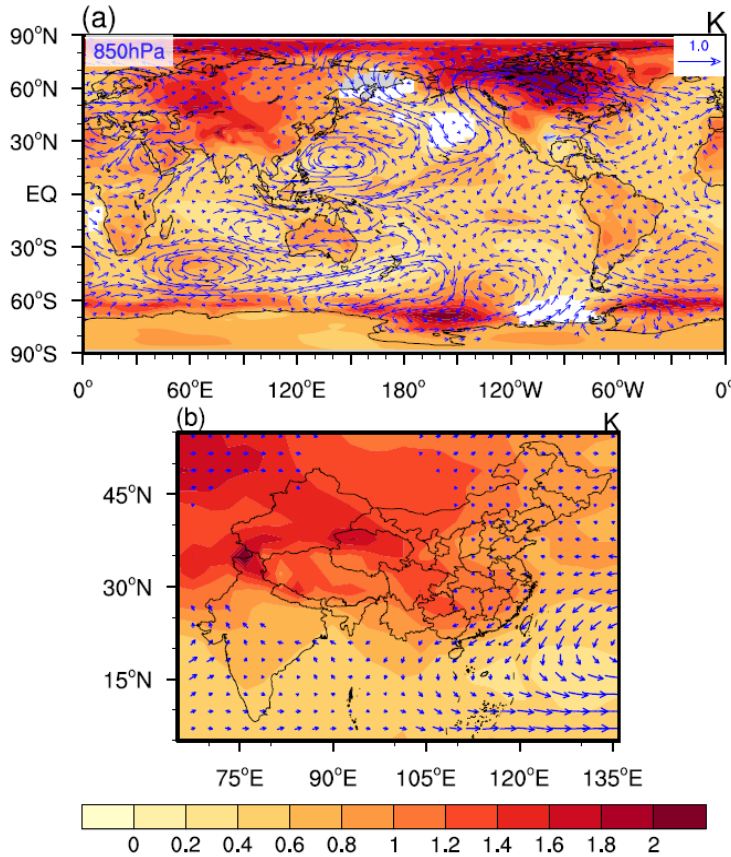


Annual mean differences of BC loading (left column), low cloud (middle column), and high cloud (right column) between S_{ERF2010} and ERF_{1850}

Results

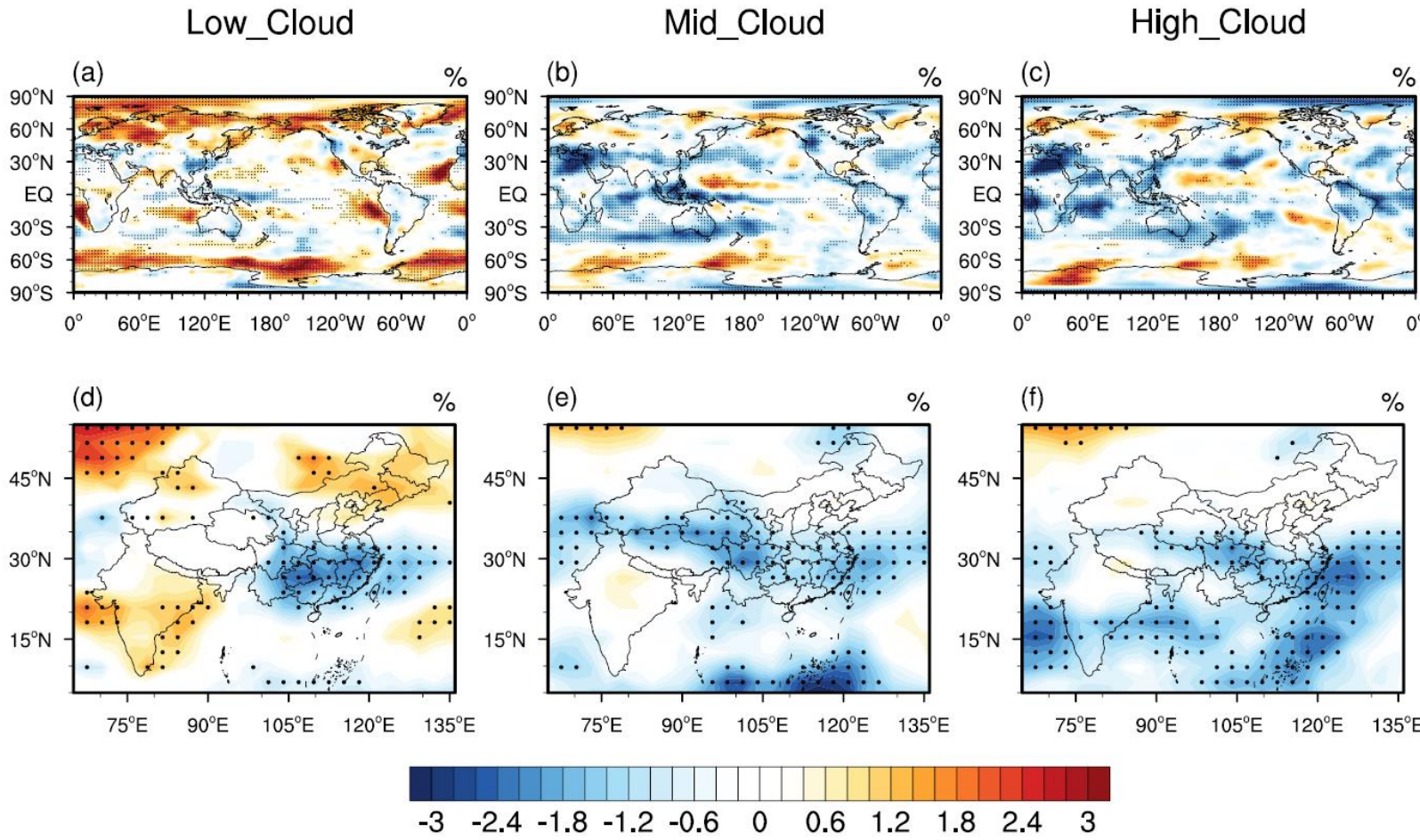


SAT & Circulation



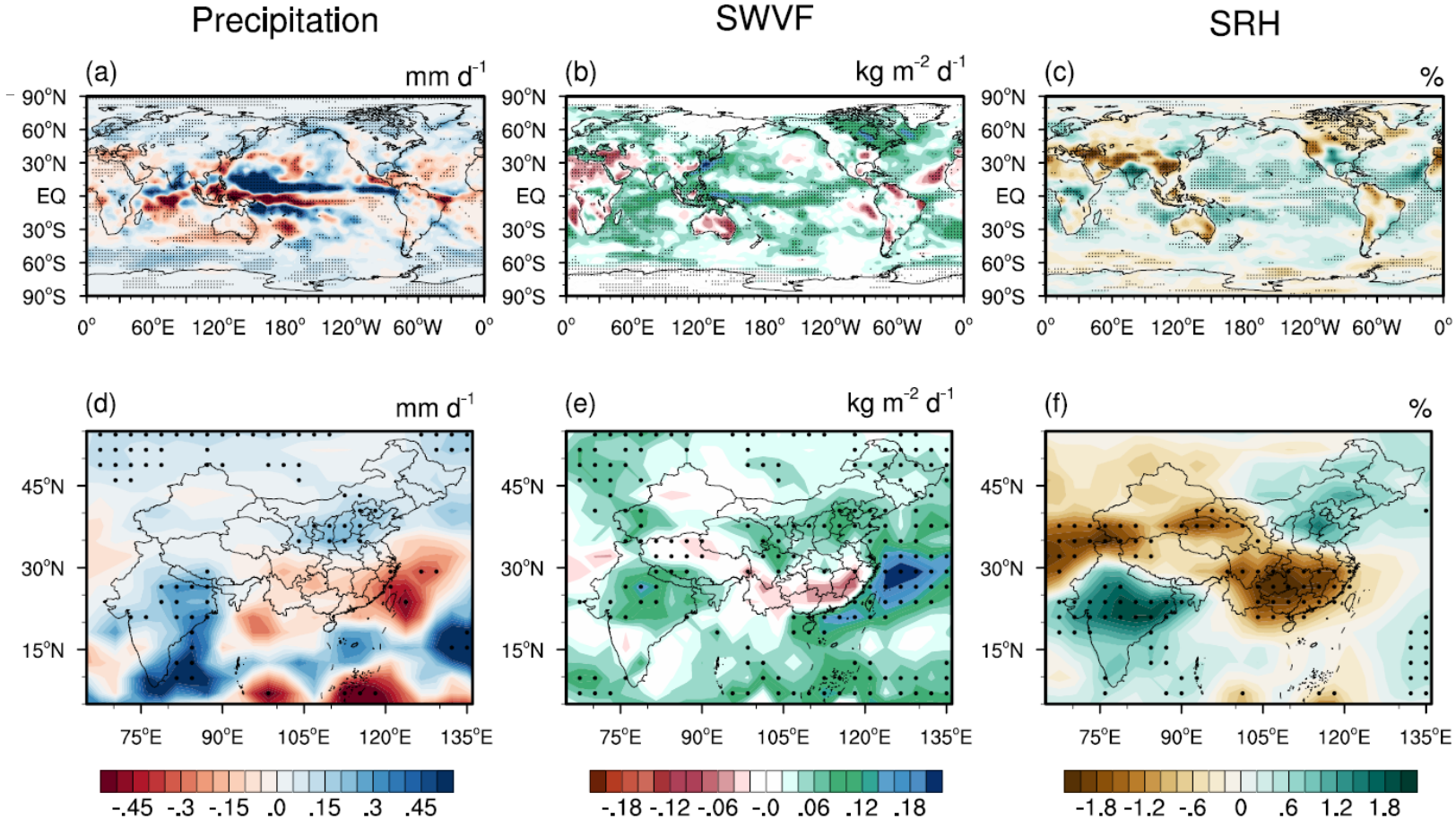
Annual mean differences of surface air temperature (Left) and SNRF/FSNS/FLNS (Right) between S_{CR2010} and CR_{1850} .

Results



Annual mean differences of low (left column), middle (middle column), and high (right column) cloud covers between S_{CR2010} and CR_{1850} .

Results



Annual mean differences of precipitation (left column), SWVF (middle column), and SRH (right column) between SCR2010 and CR1850.



Thank you!